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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,098	12/21/2005	Takashi Ito	9369-114US (T37-196236C)	8148
570. 7590 02/14/2008 PANITCH SCHWARZE BELISARIO & NADEL, LLP ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103				
EXAMINER				
EOFF, ANCA				
ART UNIT		PAPER NUMBER		
1795				
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02/14/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/562,098

**Applicant(s)**

ITO ET AL.

**Examiner**

ANCA EOOF

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 28 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1 and 3-10 are pending in the application. Claim 2 is canceled.
2. The foreign priority document JP 2003-180470 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

***Claim Objection***

3. Applicant is advised that should claim 3 be found allowable, claim 4 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Please cancel one of claims 3 or 4.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 3-8 and 10 are rejected under 35 U.S.C. 103(a) as obvious over Steinmann (US Pg-Pub 2004/0137368) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158 ).

With regard to claims 1, 3-4 and 10, Steinmann discloses a radiation-curable composition useful for the production of three dimensional articles by stereolithography comprising:

- (A) at least one cationically polymerizing organic substance;
- (B) at least one free-radical polymerizing organic substance;
- (C) at least one cationic polymerization initiator;
- (D) at least one free-radical polymerization initiator (par.0023-0027).

As cationic polymerization initiator, Steinmann discloses the compound UVI 6974 from Union Carbide (par.0077), which contains (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate.

The (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate is the same compound with the one in formula (I) of the instant application, when M is an antimony atom, so it meets the limitations of claims 1 and 3-4.

However, Steinmann fails to disclose that a sulfonium salt of formula (1) of a purity of 99% or higher and containing less than 3% by mass of a compound represented by the formula (2) of the instant application is used as cationic polymerization initiator in the radiation-curable composition for stereolithography.

Date et al. disclose a method of manufacturing sulfonium salts used as photocationic polymerization initiators for resists (par.0045).

In Examples 1-3, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate with a purity of 99 % (par.0047-0062).

In Example 5, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% (par.0063-0065). It is not explicitly specified that (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate is synthesized in Example 5 but the ingredients are the same as for Example 2 which leads to (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate except that potassium hexafluoroantimonate replaces potassium hexafluorophosphate.

Date et al. further disclose that <sup>13</sup>C-NMR analysis and IR analysis indicated that small amounts a raw materials are contained in the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate (par.0064), wherein the raw materials used in the synthesis are diphenyl sulfoxide, diphenyl sulfide, potassium hexafluoroantimonate, acetonitrile and acetic anhydride (par.0052-0053 and par.0063).

It is the examiner's position that there is no compound represented by formula (II) of the instant application in the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate of Example 5 of Date et al., therefore the limitations of claims 1 and 10 for the quantity of compound of formula (II) are met.

It would have been obvious for one of ordinary skill in the art to use the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% obtained in the process of Date et al. as photocationic polymerization initiators in the composition of Steinmann et al., since Date et al. specifically indicate this use for the high-purity sulfonium salts (Date et al., par.0045 and par.0062).

With regard to claim 5, Steinmann further discloses that the cationically polymerizable compound can be an epoxy cresol novolac, epoxy phenol novolac compound, which possess more than one epoxide group in the molecule (par.0048).

With regard to claim 6, Steinmann further discloses that the free radically curable component preferably comprises at least one poly(meth)acrylate, for example di-, tri-, tetra-, or pentafunctional monomeric or oligomeric aliphatic, cycloaliphatic or aromatic acrylates or methacrylates (par.0064).

With regard to claim 7, Steinmann further discloses that the radiation-curable composition further comprises at least one hydroxyl-functional oxetane compound (F) (par.0023-par.0029).

In Example 1 (table 2, par.0151), Steinmann specifically discloses that 3-ethyl-3-hydroxymethyl-oxetane (Cyracure UVR 6000, in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 26.78 wt.% with respect to the 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

With regard to claim 8, Steinmann discloses that the radiation-curable composition further comprises at least one hydroxyl-functional compound (E) (par.0023-par.0028), such as polypropylene glycols of various molecular weights (par.0094), glycerine propoxylated polyether triol and polyethyleneglycols (par.0103). These compounds are equivalent to the polyalkylene ether compounds of the instant application.

In Example 1 (table 2, par.0151), Steinmann specifically discloses that glycerine propoxylated polyether triol (Voranol CP 450 in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 17.85 wt.% with respect to 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyacure UVR 6110, in table 1, par.0143).

With regard to claim 9, Date et al. disclose the synthesis of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate in Example 5 (par.0063-0065). The purity of the compound is more than 99% so raw materials are comprised in an amount of less than 1% (par.0064 shows that raw materials are the impurities found in the compound).

Since the raw materials for the synthesis of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate comprise about 30% diphenylsulfoxide (par.0052-0053 and par.0063), it would be expected that the mixture of raw materials left as residues in the of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate would comprise 30% diphenylsulfoxide.

Therefore, the 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate obtained in Example 5 would comprise less than 0.3% of diphenylsulfoxide, which encompasses the range claimed in claim 9 of the instant application.

***Response to Amendment***

7. The objection to the specification is withdrawn following the applicant's amendment.
8. The Declaration under 37 CFR 1.132 filed on November 28, 2007 is sufficient to overcome the rejection of claims 1-6 under 35 USC 102 (b) over Schulthess (US Patent 5,783,358) and the rejection of claims 1-8 under 35 USC 102(e) over Steinmann (US Pg-Pub 2004/0137368).
9. The rejection of Schulthess in view of Date has been withdrawn.
- Also, the rejection of claims 1-8 under 103 (a) over Steinmann (US Pg-Pub 2004/0137368) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158 ) as set forth in the last Office action because Date et al. clearly disclose (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate with a purity of 96 % (par.0061).

In the rejection of claims 1-8 under 103 (a) over Steinmann (US Pg-Pub 2004/0137368) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158 ) as set forth in the last Office action, the examiner showed that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate with a purity of 96 % as photoinitiator in the composition of Steinmann , since Date et al. specifically indicate this use for the high-purity sulfonium salts (see paragraph 5 of the Office Action).



***Response to Arguments***

10. Applicant's arguments with respect to claims 1 and 3-10 have been considered but are moot in view of the new grounds of rejection.

On page 5-9 of the Remarks, the applicant is showing how the newly amended claims differentiate over the prior art rejections formulated in the previous Office Action. However, new grounds of rejection are shown above.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anca Eoff whose telephone number is 571-272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-5:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AE

/Cynthia H Kelly/  
Supervisory Patent Examiner, Art Unit 1752